

What Is the Risk and Return Relationship?

Worksheet

The risk-return relationship shows that an investment's expected return is proportional to the risk it carries—higher risk demands higher compensation (return).

$$E(R) = R_f + \beta(R_m - R_f)$$

$E(R)$ = Expected return (%)

R_f = Risk-free rate (%)

β = Beta (systematic risk)

R_m = Market return (%)

Questions

1. The risk-return relationship means...

- A) All risky investments outperform safe ones
- B) Higher risk investments offer higher expected returns
- C) Risk and return are unrelated
- D) Safe investments always lose money

2. What does $\beta = 2$ mean?

- A) The stock is twice as risky as the market
- B) The stock rises 2% daily
- C) The stock's return is \$2
- D) The stock has no risk

3. The Security Market Line (SML) shows...

- A) Stock price history
- B) The risk-return trade-off
- C) Market trading volume
- D) Daily price momentum

4. If a stock has $\beta = 0.7$, it is...

- A) Riskier than the market
- B) Less risky than the market
- C) As risky as the market
- D) Zero risk

5. Risk-free rate = 3%, Market return = 11%, Stock $\beta = 1.5$. What is expected return?

6. Treasury bond ($R_f = 2\%$), Tech stock ($\beta = 2.5$, market return = 10%). Compare expected returns.

7. Two stocks: A ($\beta = 0.8$) and B ($\beta = 1.3$). Risk-free = 4%, Market = 9%. Which has higher expected return?

8. Define: What does beta measure?

9. Define: What is the risk-free rate?

10. Define: What is risk premium?

Answer Key

1. B) Higher risk investments offer higher expected returns — Investors demand higher expected returns to compensate for bearing risk.
2. A) The stock is twice as risky as the market — $\beta=2$ means the stock swings 2× more than the market average.
3. B) The risk-return trade-off — The SML plots the expected return for each level of systematic risk (beta).
4. B) Less risky than the market — $\beta<1$ means lower volatility than the overall market.
5. $E(R) = R_f + \beta(R_m - R_f) = 3\% + 1.5(11\% - 3\%) = 3\% + 1.5(8\%) = 3\% + 12\% = 15\%$ The stock's higher beta (1.5) justifies 15% expected return.
6. Bond return = 2% (certain, low risk) Stock $E(R) = 2\% + 2.5(10\% - 2\%) = 2\% + 20\% = 22\%$ The 20% risk premium compensates for the stock's higher volatility.
7. Stock A: $E(R) = 4\% + 0.8(9\% - 4\%) = 4\% + 4\% = 8\%$ Stock B: $E(R) = 4\% + 1.3(9\% - 4\%) = 4\% + 6.5\% = 10.5\%$ Stock B has higher risk ($\beta=1.3$) and higher expected return.
8. Beta measures a stock's volatility relative to the market. $\beta=1$ matches the market; $\beta>1$ is more volatile; $\beta<1$ is less volatile.
9. The return from zero-risk investments like U.S. Treasury bills.
10. The extra return demanded for taking on risk: Risk Premium = $E(R) - R_f$.

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